

## COMBINATION TELEPHONE AND CALCULATOR

### BACKGROUND OF INVENTION

There is an ever increasing need in the business world for such electronic equipment as calculators, dictating machines, telephones, and the like. At present, each of these respective pieces of equipment are separate and apart one from another. The presence of each of the respective independent pieces of equipment on a businessman's desk provides a problem of crowding of the desk. A genuine need exists for some means to compact and combine one or more of these pieces of equipment.

There are in use today some special pieces of telephone equipment wherein the touch tone keyboard is used as an input for certain equipment. One such device utilizes the touch tone key board of the telephone to provide a sequence of touch tones representative of numbers of the keyboard as inputs to a remote computer which decodes the touch tones and provides return signals which are likewise decoded and represent stock quotations. Other variations of this device utilize the touch tone generators to send the tone signals across the telephone lines to remote computers where they are decoded. In all such devices, the keyboard of the telephone, when operating as the input to the remote computer, generates the touch tone signals which are transmitted across the telephone lines to a remote station at which they are decoded and utilized as inputs. None of these applications directly uses the contacts of the touch tone keyboard as the inputs to the calculating device separate from the tone generating functions of the keyboard.

### OBJECTS AND SUMMARY OF INVENTION

It is the object of the present invention to provide improvements to touch tone type telephones wherein the keyboard of the telephone provides a direct input to a calculating device without utilizing the tone generators or decoding thereof.

The foregoing object of the present invention is carried out by means of a multiple contact double throw switch which disengages the seven outputs from the touch tone keyboard from the tone generators and applies the seven outputs to a decoding matrix. The decoding matrix which, in one embodiment, includes twelve dual input nand gates decodes the seven outputs representative of the twelve buttons in the touch tone keyboard and provides at least ten of these outputs as the numeric inputs from zero to nine as the inputs to an electronic calculator.

Other objects and advantages of the present invention will become apparent to those skilled in the art from the detailed description thereof taken in view of the drawings.

### DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of a telephone keyboard and modifications thereof suitable for use with a calculator; and

FIGS. 2 and 3 are a schematic diagram of the switching means and decoding means employed in the present invention in respect to common telephone circuitry.

### DETAILED DESCRIPTION OF INVENTION

A telephone housing modified in accordance with the present invention is shown in FIG. 1 of the drawing. The telephone 10 employs the ordinary and well known

configuration of touch tone buttons 11 which include the numerals zero through nine and the special function buttons on the left and right of the operator or zero button. The telephone housing has been modified to include an array of calculator function buttons 12 disposed to the right of the array of normal touch tone buttons 11. The calculator function buttons operate to carry on the calculating functions as are well known in the art.

The telephone housing has been further modified to provide an illuminated numeric display 13. Such a display contains positions for 12 digits and is of the type commonly utilized in calculators. The housing further includes a two position switch 14. The switch is designed to switch the use of the touch tone buttons 11 between their normal use for dialing and as the input to a calculator as hereinafter described in respect to FIGS. 2 and 3.

Referring now to FIGS. 2 and 3, there is shown the circuitry utilized in a conventional touch tone telephone in combination with the switching and decoding circuitry of the present invention which provides the dual function of the touch tone keyboard. The touch tone keyboard of a conventional telephone presents an array of three buttons across and four vertically. The buttons are mechanically interconnected to seven contacts numbers 15-21 in such a manner that depression of any one of the buttons will close two contacts, one associated with the vertical array and one associated with the horizontal array numbers 18-21. The resultant two outputs, depending upon the number depressed, are applied as two separate inputs to a tone generator enclosed within broken lines of FIG. 2. The tone generator creates a dual tone pair indicative of the number depressed.

The dual tone so generated is transmitted from the telephone across the telephone line to effect the dialing function at a central office. The tone generating circuitry shown in FIG. 2 as well as related circuitry for disconnecting the earpiece of the telephone during dialing is conventional and well known circuitry and it is not believed necessary to the description of the present invention to further describe the details or operation thereof.

In accordance with the present invention, the seven outputs from the touch tone keyboard passing through switches 15-21 are applied to plurality of double pole double throw switches S1-A through S1-G. The switches are shown in FIG. 2 in their special function position for use of the keyboard as an input to a calculator. When switch S1 is thrown to the position shown in FIG. 2, the seven separate outputs from the keyboard are disengaged from the tone generators and applied as inputs to seven lines 22-28 shown in FIGS. 2 and 3.

Switch S1 also includes two contacts S1-I and S1-H. Closure of these contacts occurs whenever switch S1 is placed in the calculator position as shown in FIG. 1. When these contacts are closed, a 6 volt source is applied upon lines 29 and 30 leading to one side of the touch tone contacts 15-21.

The seven output lines 22-28 from switch S1 are interconnected into a decoding matrix which utilizes twelve dual input nand gates G1 through G12. Upon depression of any one to the twelve buttons in the telephone keyboard, a circuit will be completed which will apply the 6 volt potential across one of lines 22-24 in